

## CLAIMS

1. A fuel cell system comprising:

a fuel gas supply mechanism (1, 91-97) which supplies a fuel gas;

5 an oxidizing gas supply mechanism (2) which supplies an oxidizing gas;

a fuel cell (5) which generates power using the fuel gas supplied from the fuel gas supply mechanism (1, 91-97) and the oxidizing gas supplied from the oxidizing gas supply mechanism (2); and

10 a water recovery device (41, 42) which recovers water contained in an exhaust gas from the fuel cell (5), the water recovery device (41, 42) including a liquid introducing mechanism (61, 62) which sprays a water-compatible liquid onto a location where the water is recovered by the water recovery device (41, 42).

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2. The fuel cell system as defined in Claim 1, further comprising a cooling device (21) which cools the fuel cell (5) using a cooling water-antifreeze mixture,

wherein the cooling water-antifreeze mixture for cooling the fuel cell  
20 (5) is used as the water-compatible liquid.

3. The fuel cell system as defined in Claim 2, wherein the fuel gas supply mechanism (1) is a device which stores hydrogen, and

the system further comprises a humidifier (3, 4) which humidifies at  
25 least one of the fuel gas and the oxidizing gas using the cooling water-antifreeze mixture for cooling the fuel cell (5).

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4. The fuel cell system as defined in Claim 3, comprising:

a first cooling water tank (22) which stores the cooling water-antifreeze mixture for cooling the fuel cell (5); and

5 a controller (81) which controls an amount of water recovered by the water recovery device (41, 42) on the basis of an antifreeze concentration of the first cooling water tank (22).

5. The fuel cell system as defined in Claim 4, comprising:

10 a second cooling water tank (44) which stores the cooling water-antifreeze mixture for cooling the water recovery device (41, 42); and

a flow control mechanism (57) which introduces the cooling water-antifreeze mixture in the second cooling water tank (44) into the  
15 first cooling water tank (22),

wherein the controller (81) controls an amount of cooling water-antifreeze mixture to be introduced into the first cooling water tank (22) from the second cooling water tank (44) via the flow control mechanism (57) in accordance with the antifreeze concentration of the  
20 cooling water-antifreeze mixture in the first cooling water tank (22).

6. The fuel cell system as defined in Claim 1, wherein the fuel gas supply mechanism (91-97) comprises:

a fuel tank (92) which stores a fuel;

25 a fuel supply mechanism (93, 94) which supplies the fuel from the fuel tank (92);

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a liquid mixture tank (95) which stores a liquid mixture of water and the supplied fuel;

a liquid mixture supply mechanism (96, 97) which supplies the liquid mixture of water and fuel from the liquid mixture tank (95); and

5 a fuel reforming device (91) which generates a reformat gas containing hydrogen by reforming the fuel from the supplied liquid mixture of water and fuel, and

either one of the fuel from the fuel tank (92) and the liquid mixture of water and fuel from the liquid mixture tank (95) is used as the  
10 water-compatible liquid.

7. The fuel cell system as defined in Claim 6, wherein the water recovered by the water recovery device (41, 42) is returned to the liquid mixture tank (95).

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8. The fuel cell system as defined in Claim 7, further comprising a controller (81) which controls the amount of water recovered by the water recovery device (41, 42) on the basis of a fuel concentration of the liquid mixture in the liquid mixture tank (95).

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9. The fuel cell system as defined in Claim 8, comprising a flow control mechanism (93) which introduces the fuel from the fuel tank (92) into the liquid mixture tank (95),

wherein the controller (81) controls an amount of fuel to be  
25 introduced into the liquid mixture tank (95) from the fuel tank (92) via the flow control mechanism (93) on the basis of the fuel concentration of

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the liquid mixture tank (95).

10. The fuel cell system as defined in Claim 1, wherein the controller (81) controls an amount of water-compatible liquid to be sprayed from the liquid introducing mechanism (61, 62) onto the location where the water is recovered from the exhaust gas on the basis of an ambient temperature of the water recovery device (41, 42).

11. The fuel cell system as defined in Claim 11, wherein the controller (81) controls the amount of water-compatible liquid to be sprayed from the liquid introducing mechanism (61, 62) onto the location where the water is recovered from the exhaust gas on the basis of an amount of power generated by the fuel cell (5).

12. A water recovery method for a fuel cell system having a fuel gas supply mechanism (1, 91-97) which supplies a fuel gas, an oxidizing gas supply mechanism (2) which supplies an oxidizing gas, and a fuel cell (5) which generates power using the fuel gas supplied from the fuel gas supply mechanism (1, 91-97) and the oxidizing gas supplied from the oxidizing gas supply mechanism (2), the method comprising:

recovering water contained in an exhaust gas from the fuel cell (5),  
and

spraying a water-compatible liquid onto a location where the water is recovered.